

138482-2

REMARKS

Claims 1-3 are pending in the present Application. Claims 1-3 have been amended, and Claims 4-7 have been added, leaving Claims 1-7 for consideration upon entry of the present Amendment.

Support for the amendment to Claims 1-3 and for new Claims 4-7 can at least be found in the specification at page 3, line 13 and at pages 8-9.

The Specification has been amended to correct certain typographical errors, as explained in detail below. No new matter has been introduced by these amendments. Reconsideration and allowance of the claims is respectfully requested in view of the above amendments and the following remarks.

IDS

The Examiner did not return a signed copy of the second page of the PTO-1449 form that was filed with the information disclosure statement filed on December 20, 2003. While it is noted that the Examiner has cited several of the same references listed on this form, Applicants still respectfully request that the Examiner acknowledge the second page of the PTO-1449 form and initial all of the listed references contained therein.

Specification

As requested by the Examiner, Applicants have inserted a section entitled "BRIEF DESCRIPTION OF THE DRAWING" after the section entitled "SUMMARY" and before the section entitled "DETAILED DESCRIPTION" to briefly describe Figure 1. Support for this amendment can at least be found in Figure 1 and in the specification at page 9 lines 15-16. Applicants respectfully request that the objection to the specification be withdrawn.

Additionally, it is noted that in reviewing the application a number of minor typographical errors were noted. For example, the phrase "the said" appearing in several paragraphs has been amended to "the". In line 1 of page 9, the misspelling of heat-carrying agent has been corrected. Applicants respectfully request that these amendments be entered.

Claim Rejections Under 35 U.S.C. § 112, First Paragraph

Claims 1-3 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to enable any

138482-2

person skilled in the art to which it pertains, or with which it is most nearly connected, to use and make the invention commensurate in scope with these claims. More particularly, the Examiner alleged that the specification does not "provide enablement for any compound that can be categorized as an ammonium salt". (O.A., page 2).

Applicants have amended independent Claim 1 to more clearly define Applicants' claimed invention. More particularly, the ammonium salt of Claim 1 has been amended to an "ammonium salt of an organic acid or a carbonic acid". Support for this amendment can at least be found in the specification at page 3, line 13. It is noted that the exemplary ammonium salts listed by the Examiner in the office action, e.g., ammonium bicarbonate, ammonium carbonate, and ammonium carbamate, are taught by Applicants as being examples of ammonium salts of organic acids or carbonic acid. (Page 3, lines 11-20). Since the specification enables one of skill in the art to use and make an invention commensurate in scope with independent Claim 1, Applicants' respectfully request that the Examiner withdraw the rejection with regards to Claims 1-3.

Claim Rejections Under 35 U.S.C. § 112, Second Paragraph

Claims 1-3 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Examiner stated

Claim 1 recites the limitation of 'wherein the process is conducted in the presence of a mixture...' There is no process given there are no reagents. It is unclear what is being oxidized and how it is being oxidized....Claim 1 recites a 'continuous aqueous-emulsion oxidation in a series of oxidation'....However it is unclear what is mean by this limitation....Claim 1 states that the process is conducted in the 'presence of a mixture of an aqueous solution of an ammonium salt with a concentration of 0.001-05 mass %. This claim is confusing as to the metes and bounds of the instant invention. The same problem is occurring with the ammonium concentration. (O.A., pages 3-4).

Applicants have amended independent Claim 1 to more clearly claim Applicants' claimed invention. More particularly, Claim 1 is now directed to a method of producing cumene hydroperoxide comprising reacting in a series of oxidation reactors oxygen with cumene by passing the oxygen through a water-cumene emulsion in a presence of a mixture of an aqueous solution of an ammonium salt of an organic acid or a carbonic acid with a concentration of

138482-2

0.001-0.5 mass % based upon a total mass of the aqueous solution of the ammonium salt and an aqueous solution of ammonia with a concentration of 0.001-0.5 mass % based upon a total mass of the aqueous solution of the ammonia, wherein the mixture is fed into each oxidation reactor of the series of oxidation reactors in an ammonia: ammonium salt mass ratio of between 1:100 to 100:1.

With regards to the Examiner's concern about the mass percent of the aqueous ammonium salt and an aqueous solution of ammonia, Applicants respectfully submit that one of skill in the art would readily understand what is meant by the mass percents. Nevertheless, to further clarify the claims and to advance prosecution, Applicants have amended the claims to clarify that the mass percents are based on the respective aqueous solutions.

With regards to Claim 2, Applicants have amended the claim to provide proper antecedent basis to "the first oxidation reactor" and "the last oxidation reactor".

With regards to Claim 3, Applicants have amended the form of the claim to make it a process limitation.

Since Applicants' Claims 1-3 particularly point out and distinctly claim the subject matter which applicants regards as the invention, Applicants respectfully request that the Examiner withdraw the rejections to Claims 1-3.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 1-3 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent No. 5,767,322 to Zakoshansky et al. Applicants respectfully traverse this rejection.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness, i.e., that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

138482-2

In making the rejection, the Examiner stated that Zakoshansky et al. differs from Applicants' claimed invention in that "a ratio of ammonium salt and ammonia is not given." (O.A., page 5). Further, the Examiner stated that "[i]t is well within the purview of one of ordinary skill in the art having a known process to optimize the process to optimize the yield or purity." (O.A., page 6).

Applicants agree with the Examiner in that Zakoshansky et al. does not teach a ratio of ammonium salt to ammonia, but disagrees with the Examiner that Applicants' claimed invention would have been obvious over Zakoshansky et al. For example, absent in Zakoshansky et al. is any teaching or suggestion that would have lead one of skill in the art to Applicants' claimed ammonium salt to ammonia ratio with any reasonable expectation of success. Zakoshansky et al., as a whole, teach that a greater efficiency in a water-alkaline emulsion cumene oxidation process using a cascade of reactors can be obtained by:

splitting the reactor cascade into 2 stages with the first stage utilizing $\text{NH}_4 \text{NaCO}_3$ as the active carbonate in the stage containing less than 18% by weight cumene hydroperoxide and using Na_2CO_3 as the active carbonate in the stage containing more than 18% by weight cumene hydroperoxide. By directly injecting ammonia into a recycle stream organic acids are efficiently neutralized. A counter current water wash of the second stage also increases process efficiency by scrubbing out unwanted impurities. Control of pH in the process improves efficiency and reduces impurity levels.

(Abstract).

In other words, one of skill in the art considering Zakoshansky et al. at the time Applicants filed their patent application would not have been motivated to use the ratio of ammonium salt to ammonia claimed by Applicants. For at least this reason, Applicants' independent Claim 1 is not obvious over and is allowable over Zakoshansky et al. Moreover, as a dependent claim from an allowable independent claim, Claims 2-3, are, by definition, also allowable.

Prior art made of Record

Applicants respectfully submit that Applicants' claimed invention is not anticipated and is non-obvious over any of the prior art made of record.

138482-2

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance are requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 07-0862.

Respectfully submitted,

CANTOR COLBURN LLP

By 

Joel T. Charlton

Registration No. 52,721

Date: August 20, 2004
CANTOR COLBURN LLP
55 Griffin Road South
Bloomfield, CT 06002
Telephone (860) 286-2929
Facsimile (860) 286-0115
Customer No.: 23413